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SUBJECTIVE APPROACH TO ASSESSING POVERTY IN POLAND – IMPLICATIONS FOR SOCIAL POLICY

Leszek Morawski[1], Adrian Domitrz[2]

ABSTRACT

The poverty rates based on the OECD scales are frequently used in public debate. In this scale, large families are usually identified as those most in need of financial support. Poland is an interesting case for applying an alternative, subjective approach to calculating equivalent scales, as Poland has a large mean size for households, and is dependent on means-testing in social policymaking. The overall poverty rates for the two approaches are not distinctly different but they lead to significantly different distributions of poverty, as different types of households are considered in line with the result in Bishop et al. (2014) for the eurozone countries. The subjective approach suggests that one-person households, not large families, should be considered most at risk of material poverty. Futhermore, the relative positions of households in the income distributions also differ considerably. As a consequence, the current shape of social policy in Poland may need to be reconsidered in order to distribute public transfers more accurately.

Key words: subjective poverty, household equivalence scale, social policy.

Introduction

In 2010, households with two adults and three or more children were at the relatively highest risk of poverty in Poland. The at-risk-of-poverty rate calculated for the poverty line set at 60% of median equivalised income was 32.8% in this group. This value for one-person households was 24.5%, for two adults with one child it was 12.3%, while for households classified as “at least three adults with a child” it was 19.5% in the same year. The overall rate in 2010 was 17.7%. The equivalised income applied in those calculations was based on a modified OECD equivalence scale that gave a weight of 1.0 to the first adult in a household, a

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weight of 0.5 to the second one and to each subsequent person aged 14 and over, and a weight of 0.3 to each child aged under 14.[3]

The Eurostat data clearly pointed to "large households" as those units at which social transfers need to be targeted. The poverty statistics published by the Polish Central Statistical Office (CSO) make this conclusion even stronger. The recently published information has revealed the poverty rate among parents with 4 and more children to be equal to 43.7% and among parents with 3 children to reach 25.8%. The overall rate published was 16.7%. These rates were calculated using expenditure data and the original OECD equivalence scale with weights equal to: 1, 0.7, and 0.5 (GUS, 2011a).

Despite growing literature on the non-income factors influencing "subjective well-being" and the multidimensional character of poverty, financial transfers still play a major role among the used solutions. The discussion about the official poverty statistics that are based on the OECD scales may significantly influence the allocation of social financial transfers. For example, in the parliamentary campaigns in Poland in 2007 and 2011, all major parties proposed policies targeted toward large families, which were perceived as needing special assistance on the grounds of the official poverty statistics. Recently, the new Polish government launched a very generous social programme called the "Family 500+". According to this regulation, 500 PLN (117 Euro) per month will be paid unconditionally for the second and each additional child in a family. The income criteria as 800 PLN per month per person (1200 PLN in the case of a disabled child in a family) was introduced for families with one child. It is estimated that about 3.7 children is eligible for that benefit.

Using subjective information on income evaluation is not a new idea and it may be partially attributed to the criticism of the "revealed preferences" concept as an indicator of "true" individual well-being by behavioural welfare economists (Veenhoven, 2002; Schokkaert et al., 2011). This may be attributed to the fact that the equivalence scales derived from the consumer demand data using the basis of the revealed preferences theory suffer from identification problems and, thus, some extra conditions are needed in order to calculate them with such an approach (Pollak and Wales, 1979, Blundell and Lewbel, 1991). Some authors suggested using subjective information from survey declarations about happiness or income satisfactions as a solution to the identification problem (Lewbel and Pendakur, 2008). Apart from that, there are authors developing other empirical methods such as matching estimators or indifference equivalence scales, both based on scrutiny of individual level behaviour.

In practice, simple OECD scales, either the "original" or the "modified" ones are commonly used. Two recent studies show significant differences between the subjective and the OECD scales (Bollinger et al., 2012; de Ree et al., 2013). The study of Bollinger et al. (2012) for England suggests, for example, larger scale

[3] All numbers in the section are from the Eurostat webpage: http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do (last access on 2017.06.05).

economies within couples and substantial diseconomies due to any additional person after considering subjective information on income evaluation. We believe that considering subjective information about income evaluation may lead to interesting results that may be not consistent with those obtained with conventional OECD scales. Also, additional motivation for this paper is the fact that, to our knowledge, subjective poverty in Poland is quite limited despite the fact that the works regarding subjective equivalence scale were initiated already in the 1990s by Podgórski (1990, 1991, 1994). His research showed much flatter equivalence scales implied by the subjective approach than the commonly used OECD scales. More recent works applying a subjective approach for Poland are those of Dudek (2009), Dudek (2012), Dudek and Landmesser (2012), Kalbarczyk-Stęclik (2016). The subjective approach to poverty is discussed in Panek and Czapiński (2015) in research based on data from the Social Diagnosis Program (Diagnoza Społeczna).

The household sector in Poland is dominated by a small size structure (in terms of number of people). A significant share of multi-person households may be of importance to poverty analysis results since the difference between the OECD scales and subjective scale is increasing in household size. This is exactly the case of Poland, which with 2.8 people per household belongs to the group of countries with the largest average household size among EU countries. A similar household size is observed in other less-developed European countries such as Slovakia, Cyprus, Romania, Malta and Bulgaria, while Germany, Netherlands, France, United Kingdom and all the Scandinavian countries are the ones with much smaller average household sizes. At the same time, the structure of the household sector regarding the number of children in a household observed in Poland is very similar to the EU25 average - in the case of households with 4 children the fractions are 2.7% and 2.6%, for those with 3 children 8.6% and 9.0%, while for those with 2 children it is as high as 35.2% and 38.9% (Iacovou and Skew, 2010).

Frequent use of the statistics based on the OECD scales in public discussion, the size structure of the household sector together, as well as differences between the OECD scale and subjective scale, make Poland an interesting case for asking what would happen if politicians used the subjective scale instead of the OECD scale as reference. In this paper we ask whether the conclusion about the need for special treatment of large families is sensitive to a choice of equivalence scales. Although many other approaches to equivalence scales and to poverty analysis as a whole are possible, we take a closer look at comparison of these two methods in detail: OECD (the so-called expert scales) and subjective (known as Leyden Poverty Line) scales. Such an approach allows us to focus on the range and nature of discrepancies between them and to open a broader discussion on avenues of future research on such differences. We restrict our analysis to income poverty keeping in mind the importance of non-monetary measures and multidimensionality of poverty. In the paper we concentrate on the income dimension since we consider it to be most important, as justified by the

Atkinson's argument against that the separation between inequality of outcome and inequality of opportunity. According to his argument, the current inequality of outcome directly determines the future inequality of opportunity (Atkinson, 2017). The aim of the paper – comparison of the subjective equivalence scales with the OECD scales - is very closely related to the paper by Bishop et al. (2013), who made a similar exercise for the eurozone countries using the EU-SILC data.

The structure of the paper is as follows. The first section describes the methodology, namely the Leyden Poverty Line method. The second section contains the results of the estimation of the Leyden Poverty Line for Poland for 2010. The third section compares poverty incidence implied by the subjective approach with the results based on the OECD equivalence scales. The last section summarises our results and contains the final conclusion.

1. Method

In this paper, poverty is defined by the level of welfare that is just sufficient enough for a household to function properly in a society (as in: Van Praag, 1971; Van Praag and Van der Sar, 1988; Van den Bosch, 2002). If we narrow this concept solely to the question of income, we can say that "poverty" begins when a household's material situation (or income) is somehow too low to maintain a basic living standard without serious difficulty. The subjective poverty approach lets every person evaluate his or her income according to his or her feelings or needs. A subjective poverty line can be derived upon these evaluations. This is in significant contrast to the objective poverty approach, in which experts define either absolute or relative poverty lines. The objective approach is straightforward to use in practice but ignores a person's perception of income. On the other hand, the subjective method that takes into account a person's opinion about the actual material needs assumes cardinality of the utility function, which is a disputable issue. However, the subjective approach to empirical research in social science has been getting some popularity because of the recognition that many economic indicators or concepts that had been considered to use *ordinal* utility, de facto assume some sort of cardinality. Such indicators include, among others, the commonly used equity measures as they ascribe certain values to, for example, income inequality in order to say and compare which income distribution is *better* or *worse* (Ferrer-i-Carbonelland and Frijters, 2002; Van Praag and Ferrer-i-Carbonell, 2004; Binder and Coad; 2011).

In this research we return to the approach postulated by the Leyden school based on the Income Evaluation Question, in which a person (presumably the head of the household) declares income amounts corresponding to certain verbal qualifiers. Following the Leyden approach, we assume that 1) households are able to evaluate income in general as well as their own income, also in terms of verbal labels; 2) it is possible to sensibly convert the labels into a numerical evaluation

of welfare on a bounded scale such as an interval [0,1]. These claims are based on an assumption that if a respondent tries to do his best in describing his welfare using a five-label scale, he should respond as if the differences of welfare between all income levels were identical since it maximizes the information value of the respondent's answer. Such claims were criticized by Seidel (1994) and defended in Van Praag and Kapteyn (1994).

The empirical specification used below follows Kapteyn and Van Herwaarden (1981) claims that a log-normal cumulative distribution function fits best the responses from the Income Evaluation Question. That is why we assume the following relation between income and welfare:

$$\Lambda(y_i; \mu_i, \sigma_i) \equiv \Phi\left(\frac{\log(y_i) - \mu_i}{\sigma_i}\right), \tag{1}$$

with $\Phi(.)$ being a standardized cumulative distribution function, μ_i describing *the needs of a household* measured by the income demanded by it to satisfy a certain level of welfare and σ_i which defines the welfare sensitivity of income. This allows us to write the (logarithm of) δ-specific poverty line for a household with income y_i as:

$$\log\big(y_i(\delta)\big) = \mu_i + \sigma_i * \Phi^{-1}(\delta), \tag{2}$$

A parameter μ_i can be estimated by a sample mean of the declared log-incomes for each of welfare points. Estimator of σ_i that reflects how much income a household requires to change its welfare evaluation from one level to another is a sample standard deviation of declared log-incomes. We estimate individual effects μ_i by the Ordinary Least Squares regression, while σ_i is set at the value of sample average as it was found to be difficult to explain. The basic specification for μ_i includes only household size and income:

$$\log\big(y(\delta)\big) = (\beta_0 + \beta_1 * \log(L) + \beta_2 * \log(y)) + \sigma * \Phi^{-1}(\delta) \tag{3}$$

Equation (3) is called a Social Standard Function and it allows us to calculate the income y_δ that is needed for a certain household size to achieve a social standard (welfare) δ (Van Praag and Ferrer-i-Carbonell, 2004). It differs from the individual Welfare Function of Income (eq. (2)) in three points: 1) it concerns social standard income y_δ instead of the current individual income; 2) it takes into account the interaction between current income and household needs, which is a phenomenon called a preference drift; 3) it yields welfare of a social group (defined by household of size L) instead of the individual value. Defining the poverty line as the income y, which brings the welfare δ for a household with the current income equal to y, allows us to write:

$$y(L, \delta) = \exp\left(\frac{\beta_0 + \beta_1 * \log(L) + \bar{\sigma} * \Phi^{-1}(\delta)}{1 - \beta_2}\right). \tag{4}$$

Other factors such as the income of a reference group, age of the head of the household, age of children and other socio-economic variables can also be included in the financial needs regression (Van Praag, 1971; Van den Bosch, 2002). This leads to more complex poverty lines in the form of $y(L, X, \delta)$, where X includes other variables explaining financial needs. Van den Bosch (2002) suggested using either the level 0.5 (as poverty risk) or 0.4 (as poverty). Many of the studies using the above approach were conducted by researchers closely related to Van Praag and by Van Praag himself, for example: Van Praag (1971), Van Praag and Kapteyn (1976), Van Praag and Van der Sar (1988), De Vos and Garner (1991) or Van Praag and Ferrer-i-Carbonell (2004). In most cases, the functional form of the household needs or minimum income regression included income and household or family size as the only explanatory variables. Apart from the models with only income and household size as explanatory variables, other variables used were: age of the head of the household, age of children, gender of the head of the household, working status or number of workers in a household, education level and occupation of the head of the household. Generally, there is a lot of diversity in the results of the Leyden poverty incidence, presumably caused by the differences in functional forms of the regression. The comparability of results across countries is difficult due to a multitude of reasons such as differences in methodology of surveys, size of samples, as well as cultural aspects concerning, for example, life aspirations in a society and understanding of terms such as poverty, welfare, or minimum standards. Nonetheless, the direction of explanatory variables influence is quite similar in most studies and generally the equivalence scales implied by the Leyden approach indicate considerable economies of scale within households.

2. Data and results

All calculations in this paper are based on the Polish Household Budget Survey dataset (*orig*. Badanie Budżetów Gospodarstw Domowych, BBGD). The data comes from the 2010 wave of the HBS that includes the IEQ with five levels: “very bad”, “hardly sufficient”, ”sufficient”, “good”, and “very good”. The PHBS is a countrywide survey based on a random sample of households that is conducted every year by the Central Statistical Office (further: CSO; *orig.* Główny Urząd Statystyczny - details on the Polish HBS survey methodology can be found in GUS, 2011b). The monthly rotation of households method is applied, which means that households participate in a survey for only one month. Consequently, all the information reflects a state of the household in the very moment of taking part in the survey, in particular: income obtained and expenditures made are recorded throughout the month of the interview. All these questions are asked at the end of the month of the interview and are recorded at the household level. Asking income evaluation questions after a month of conducting a diary of incomes and expenditures should give more reliable

answers. Work, disability or marital status, age, educational level, etc., are recorded at the beginning of the month, and are updated at the end of the month. Altogether, the HBS provides extraordinarily detailed information on each household and its members. Specifically, there are personal characteristics, labour market activity, incomes from work and outside of work – available at the individual level; as well as housing conditions, expenditures and, above all, subjective evaluation of income – recorded at the household level.

The total sample size of the HBS 2010 exceeds 37 thousand households and corresponds to about 13.3 million households after applying the population weights. Within these households there are altogether almost 108 thousand persons, equivalent to about 37.7 million people in Poland. The most frequent group of households is the one-person household that accounts for almost one-fourth of the population. Only slightly less frequent is the household with two members – over 23% of population. The other household types are in quite similar proportions as without weighing: three- and four-person households account for ca. 20% and 18%, respectively, five-person households for about 8% and the "6+" group for almost 6% of all households (Table A1 in Appendix).

The amounts declared by the households in the IEQ differ considerably for each of the evaluation levels. Declarations of "very bad" income range from 50 PLN to as high as 25 000 PLN per household, reaching its mean at about 1320 PLN, and its median at exactly 1000 PLN. Similar variations apply for the other levels, but the answers seem consistent in that their mean and median values are always higher for each subsequent level. In the whole database there are no records of declarations, for example, stating higher amount of "very bad" income than for "sufficient" one. High variability of income evaluations proves that households' perception of income needs is quite heterogeneous - suggesting that the same amount of money for one household brings different satisfaction (or welfare) for the other one. In fact, it is one of the reasons for utilizing the Leyden approach.

Table 1 presents the estimation results corresponding to the equation (3) for two specifications. The basic form contains two explanatory variables: current income and number of household members, while the extended one includes information about the number of persons aged 14 or over, the number of persons aged 13 or less in a household, education, socio-economic household type (farmers, pensioners, those living on unearned sources), and town size. A dependent variable is declared available income, which refers to the total monthly net household income as defined by the Central Statistical Office. It comprises income from hired work, income from a private farm in agriculture, income from self-employment other than a private farm in agriculture, income from freelance work, income from property, income from rental of a property or land, social insurance benefits and other social benefits and other income. Independent variables explain more than 60.00% of the total variance of μ, although even more important is the fact that standard errors of estimators are low.

Table 1. Comparison of diagnostic results and parameter estimates from basic and extended models

	Basic model	Extended model
No. of observations	37 106	37 106
R-squared	62.06%	64.54%
_constant	4.043 (142.0)	4.614 (122.9)
log(household_size)	**0.151 (43.9)**	x
log(adults)	x	**0.189 (44.8)**
log(children+1)	x	**0.422 (6.1)**
log(income)	**0.449 (117.3)**	**0.390 (81.0)**
log(income)*log(children+1)	x	**-0.431 (-5.04)**
higher_education (d)	x	0.079 (17.4)
Socio-economic groups:		
farmers (d)	x	-0.030 (-2.8)
pensioners (d)	x	-0.060 (-16.5)
unearned_sources (d)	x	-0.128 (-12.6)
Town size:		
town_medium (d)	x	-0.119 (-25.5)
town_rural (d)	x	-0.176 (-34.6)
link test (square of fitted values t-statistic, p-value)	-5.0 (0.000)	-1.0 (0.298)

Source: Own calculations; HBS 2010.

Notes: Incomes lower than 1 PLN dropped out and incomes truncated at 0.1% and 99.9% centile. Robust covariance matrix is applied. For link test there are test statistics values and p-values in parenthesis; for explanatory variables there are parameter estimates and t-statistics in parenthesis. All variables are significant at 1% level; (d) stands for dummy variables; the base level for socio-economic groups contains households of workers and the self-employed; the base level for town size is a large city (above 500 thous. inhabitants).

Two interesting observations follow from these estimates. First, there is a positive relation between the current income and the financial needs as is generally postulated by the literature (Stevenson and Wolfers, 2008). For example, according to a basic model a financial need of a single household with an income of 500 PLN is 928 PLN and of a 4-person household with such income

needs 1141.5 PLN. The needs for the same types of households are much higher if they have 5000 PLN - the respective values are 2610 PLN and 3218 PLN. Such positive preference drift in income valuation means that the *ex-ante* income valuation is higher than the *ex-post* valuation.

Second, the family size elasticity is rather low and equal to 0.27. According to the presented estimates in Table 1, a childless couple needs an income that is higher by 11.75% than a single household, while parents with a child should have an income 15.02% higher than a childless couple to reach the same utility level.

The extended model suggests more complicated relation between the financial need, current income and household size. Still, a positive sign for the estimates on income is still the evidence of positive preference drift, whereas a negative value of the interaction suggests a decreasing drift in the number of children.

The coefficients of categorical variables look sensible, as the highest material needs are obtained for households of employees and the self-employed, living in a large city and with an educated head of household, e.g. a household where the head is highly educated needs about 8% more income to be equally satisfied than a household where the head does not have higher education. Having estimated household needs regression allows us to calculate the poverty lines for all household sizes. A modified version of equation (4) takes the form of:

$$y(\delta) = \exp\left(\frac{\beta_0 + \beta_1 * \log(adults) + \beta_2 * \log(children+1) + \sum_d \beta_d x_d + \bar{\sigma} * \Phi^{-1}(\delta)}{1 - \beta_3 - \beta_4 * \log(children+1)}\right), \quad (5)$$

where $\sum_d \beta_d x_d$ stands for summing up dummy variables coefficients.

In regard to the financial needs, the extended model gives a much wider picture of household diversity than the basic one, which shows that the subjective income evaluation is based also on variables other than the household size.

The results from the models fit well with those published by the Polish official statistics. In 2010 the poverty line for a single household was estimated by the CSO at PLN 1187, and for a couple with two children at PLN 1770 (GUS, 2011a). The poverty line at the average values of all explanatory variables except for the number of adults and children obtained from the extended model is PLN 1212 for a single household and PLN 1797 for a couple with two children. The basic model yields a line of PLN 1182 for a single household and PLN 1725 for a four-person household. The differences between the CSO estimates and our results are rather small and may be attributed to such issues as the treatment of negative incomes or a model specification, as well as the fact that the CSO estimates are only for data from the 4th quarter of the year.

Table 2 compares equivalence scales implied by both models with the modified and original OECD equivalence scales for three selected household types.

Table 2. Equivalence scales implied by basic and extended models compared with OECD scales

	1 adult	2 adults	1 adult+1 child	2 adults+3 children
basic model	1.000	1.208	1.208	1.552
extended model	1.000	1.240	1.134	1.545
modified OECD	1.000	1.500	1.300	2.400
original OECD	1.000	1.700	1.500	3.200

Source: Own calculations. HBS 2010.

Notes*:* All equivalence scales are shown in relation to a one-adult household, where an adult is defined as a person aged 14 or older. In the case of subjective models, the equivalence scale is obtained by dividing the subjective poverty line of a household of certain type by a line of a reference household. For example, if we take as a reference a one-person household, then the equivalence scale for a two-person household will be equal to the ratio of subjective poverty lines of these two types of households. For an extended model for sample average values of education, town size and socio-economic group variables are taken. The original OECD scale (known also as the Oxford scale) assigns a value of 1 to the first household member, of 0.7 to each additional adult and of 0.5 to each child. The modified OECD scale assigns a value of 1 to the first household member, of 0.5 to each additional adult and of 0.3 to each child.

Both subjective scales are much flatter than the OECD which corresponds well to results in the literature (e.g. de Ree et al., 2013; Bollinger et al., 2012; Bishop et al, 2014). In other words, the objective scales underestimate economies of scale within the households relative to subjective perception of income situation. The smallest difference is visible between the basic model and the modified OECD scale for a “1+1” household (1.208 compared to 1.300). In other cases, the differences are high, especially for a couple with three children. The results of the basic and the extended model yield slightly different equivalence scale. The extended model suggests a higher “cost” of the second adult (1.24) than the basic model (1.21). Even more, the “cost” of the first child (1.13) in the extended model is lower than in all other specifications. It means that the extended model better accounts for the households’ heterogeneity than the basic one.

Table 3 presents the results for the PHBS 2010 data in respect to a biological type of a household and by the approach to estimation of poverty. [4]

Table 3. Poverty incidence (headcount ratio) 2010 by household biological type

	Total	*1+0*	*1+1*	*2+0*	*2+1*	*2+2*	*2+3*	*2+4+*	*other w.ch.*	*other w/o ch.*
basic model	13.13	30.83	22.74	5.93	6.24	7.16	10.76	11.77	6.09	7.77
extended model	13.49	29.86	22.78	5.60	8.00	8.80	13.64	14.36	7.22	7.75
modified OECD	14.72	16.38	24.88	6.38	10.40	14.96	28.62	45.46	20.65	12.29
original OECD	15.67	9.93	27.35	5.97	11.76	20.23	38.10	61.32	28.52	13.75

Source: Author's calculations, HBS 2010.

Notes: HCR for the OECD scales calculated as 60% of the median equivalent income.

The lowest overall headcount ratio (HCR) occurs in the basic model and amounts to 13.13% of the households. The extended model yields only a slightly higher rate (13.49%). The objective poverty rates are higher, namely the headcount ratio calculated using the modified OECD scale is higher by about 1.2%, and using the original OECD – by 2.2%. The basic model yields the highest HCR (over 30%) for single households. The HCR for the extended model is slightly lower (almost 30%) but for the modified OECD scale the HCR is only about a half (16%) while for the original OECD scale – about one third (10%). An opposite conclusion may be drawn for larger households, e.g. for a couple with two children: the basic model yields HCR of 7.2%, the extended model – about 8.8%, while the traditional poverty lines lead to significantly higher rates: for the modified OECD scale it equals 15% and for the original OECD scale it is as much as 20%.

The results for the subjective models and these implied by the OECD scales are qualitatively different. The first approach suggests that a one-person household and single parents should be targeted by social policy. On the other hand, according to this approach large families are in a significantly better situation that the one postulated by the OCED. Different policy implications are also seen from the results presented in Table 4. It is visible that the basic model

[4] The relative poverty measures can differ due to differences in income distributions and in values of poverty lines when two different equivalence scales are applied. If we are interested only in the impact of the definition of the equivalence scale on the extent of relative poverty, then in both cases the same poverty line should be used. In this paper, following Bishop et al. (2013), we adopt a different approach and we allow for different poverty lines in each method.

classifies households quite similarly as the extended one. However, there are still almost 225 thousand households that are poor in the basic model but not in the extended one and 272 thousand – vice versa. Almost 1.5 million households are treated as poor in both models, thus the ratio of "classified differently" to "classified poor in both models" equals 1:3. In the case of the OECD scales, the differences are significantly larger.

Table 4. Cross-tabulation of households indicated as poor and non-poor, extended model compared with basic model and with the OECD-scales poverty (in thous. households)

	basic model		modified OECD scale		original OECD scale	
extended model:	non-poor	poor	non-poor	poor	non-poor	poor
non-poor	11 091	225	10 674	642	10 346	969
poor	272	1 492	481	1 283	684	1 080

Source: Author's calculations, HBS 2010.

Table 5 presents extra information on the differences in poverty classifications for the two approaches – the modified OECD scale and the extended subjective scale. As one may expect, the biggest differences are observed for the one-person households, for couples with 3 children – "2+3" – and couples with 4 or more children –"2+4+". There are about 440 thous. one-person households that are classified as being poor only when the subjective approach is applied. This accounts for as much as 13.5% of the total number of such units. For single parents the difference in classification results is small. There are 4.6% households that are classified as poor only for the OECD scale and about 2.5% for the subjective approach. Small differences are observed also for couples without a child and those with one or two dependent children. However, a small fraction of "2+2" households that are poor only for the OECD scale – 6.4%, is accompanied by a large absolute number of 93 thous. units.

The relative differences are large for "2+3", "2+4+" and "other household with child". Almost every third of households of parents with 4 and more children ("2+4+") is classified as poor only when the OECD scale is used. Respective fractions for "other household with child" and "couple with 3 children" are 13.7% and 15.0%. In terms of the absolute numbers, a group of "other household with child" is the largest one that is classified as poor only for the OECD approach. There are more than 250 thous. households that are not poor by the subjective standard but when the traditional approach is applied they are regarded as poor.

Table 5. Household classification in subjective approach (extended model) and expert

	Poor in expert approach								**Total**	
	No		Yes		No		Yes			
	Poor in subjective approach									
	No		No		Yes		Yes			
	%	No.	%	No.	%	No.	%	No.	%	No.
1+0	70.1	2 281.3	0.0	0.5	13.5	438.3	16.4	532.9	100.0	3 253.0
1+1	72.6	175.3	4.6	11.1	2.5	6.0	20.3	49.0	100.0	241.4
2+0	93.0	2 172.0	1.4	32.8	0.6	14.4	5.0	116.5	100.0	2 335.7
2+1	89.2	1 269.1	2.9	40.6	0.5	6.4	7.6	107.5	100.0	1 423.6
2+2	84.8	1 226.4	6.4	92.7	0.3	3.6	8.6	123.7	100.0	1 446.4
2+3	71.4	306.6	15.0	64.4	0.0	0.0	13.6	58.6	100.0	429.6
2+4+	54.5	91.0	31.1	51.9	0.0	0.0	14.4	23.9	100.0	166.8
oth w.ch.	79.1	1 469.4	13.7	254.2	0.2	3.0	7.1	131.0	100.0	1 857.6
oth w/o ch.	87.3	1 680.5	5.0	96.2	0.4	8.5	7.3	140.7	100.0	1 925.9
Total	81.6	10 671.6	4.9	644.2	3.7	480.3	9.8	1 283.9	100.0	13 080.0

Source: Author's calculations, HBS 2010 Notes: The category of "other household with child" includes "a couple with a child and other person" "single parent with a child with other person" and "other persons with a child." The category of "other household without child" is a residual one consisting of units not classified elsewhere.

In the Appendix the differences in deciles classifications are compared (Tables A2 a-c in Appendix). It shows that both approaches lead to different conclusions about the relative income situation not only for those who are at risk of poverty but also for those whose situation is relatively good. For example, 70% of one-person households are classified in the second decile by the OECD approach end up in the first decile if the subjective approach is used. An even more striking conclusion may be drawn for the middle part of distribution for the OECD scale. It is observed that 20% of those from the 5th decile are in the 2nd decile according to the alternative approach. Large movements are seen also for higher deciles. Generally, in the case of one-person households, the relative position of the household implied by the subjective approach is worse or at best the same as in the traditional approach. The opposite situation takes place when larger households are considered (Table A2b and Table A2c in Appendix). For instance, among the 2nd decile households with 3 children in the OECD-scale distribution, almost 60% of the households are classified in the 3rd decile and over

25% in the 4th decile when the subjective approach is applied. An even stronger divergence can be seen among multifamily units, where over 20% of households are in the 5th decile using the subjective approach, although they were classified in 2nd decile in the objective approach. The "migrations" from the above deciles seem fully consistent with our results concerning poverty rates within different household types.

3. Discussion on policy implications

The results presented above prove how complex and ambiguous the task to find an appropriate way of targeting social policy is. A seemingly simple question about monetary status of households turns out to be biased from the very beginning because we cannot reliably compare neither material needs nor socio- and psychological traits of different compositions of households. Despite this, the daily routine in policy-making is to take into account equivalised incomes - implicitly assuming the largely simplified OECD scales - without deeper investigation of the consequences of such an approach. Then, the results based on that simplified approach are used in deciding who should be the target group of social transfers. As we show in the paper, this group will be significantly different if we base the identification process on the subjective approach to equivalence scale. This raises the interesting question that is beyond the scope of the paper of whether we shall help people who find *themselves* poor or rather people who are *objectively* poor even if they do not consider themselves as such. Changing the current approach to the equivalence scale would mean that the whole wide range of social tools currently used should be assessed in order to verify who finally receives the transfers.

Our study suggests that at least two changes in social policy should have been considered if the subjective approach to equivalence scale had been taken seriously. First, persons living alone are the most overlooked social group with a much higher poverty risk than has been assumed so far. Simultaneously, we find larger households feeling much better about their current material situation than the objective poverty measures would imply. Joining these two facts together, it is a serious question whether the social budget should be distributed in a different way, so that a part of social tools should be terminated and perhaps a new tool proposed in its place. Second, equivalence scales are important in a discussion about tax and benefit regulations, since they have direct consequence on estimates of relative child costs. According to our results, the subjective equivalence scales suggest lower relative child cost than is embodied in the OECD modified scale. Also, the differences between subjective poverty rates and the expert rates are increasing in the number of children (Tab. 5). The fact that positional rankings of families with more children in the income distribution are better when the subjective scale is used means that we have found support for the conclusion in Bishop et al. (2013) about fixed costs of having children that are not accounted

for by the OECD scale. This has a clear policy implication since the fixed costs have to be taken into account in devising any fertility-enhancing programme.

Also, the subjective approach to equivalence scales can have even broader consequences for macroeconomic and regional policies in general, because it provides completely different income distribution across countries. An analysis of deciles migration between the presented approaches proves that there are substantial differences throughout the whole distribution and not only in its low end. As a consequence, all policy tools that include means-testing or in a different way take into account income of a household can bring a new light on the old issues.

4. Conclusion

Economic thinking on social policy is often based on very advanced models relying on the utility maximization principle and revealed preferences that, at least in theory, lead to complicated equivalence scales. On the other side, solutions used in practice are extremely simple and arguments based on poverty rates calculated with the OECD equivalence scale are often heard in public discussion. It seems that the simple practical solutions based on the OECD approach are located far away from the complex and logically consistent theoretical models.

We believe that a middle ground can be found and that subjective income evaluations give valuable information for public policy judgments, even though the possible measurement errors and the issue of comparing interpersonal satisfaction are involved while using such an approach. Accepting such imperfections does not seem to us to be a worse solution than applying the same three weights (1, 0.5, and 0.3) to all households.

This study used subjective information from surveys in order to compare the results with those based on the OECD. Being aware of the controversial nature of the method, we believe that subjective data can enrich our knowledge from the conventional approach, which may be valuable for policy evaluation. It turns out that although total poverty rates between those two approaches do not differ considerably, there are huge differences for specific sub-groups of households. We found out that the subjective equivalence scales are much flatter in the household size than the OECD ones, which corresponds well to results in the literature (e.g. Bishop et al., 2014; Podgórski, 1994). The range of economies of scale within the households postulated by the subjective approach is wider than the one from the OECD scales. This leads to policy suggestions different from those that are currently discussed. It follows that social groups that are most vulnerable to poverty are totally different in the two approaches. The official statistics based on either the Eurostat or CSO data point to large families as those who are in the relatively worst financial position. Thanks to the availability of the PHBS data, we have shown that more attention should be paid toward small households, and that the large ones are not in as bad situation as it is commonly

thought. In a country like Poland, where there is a relatively big share of large households and where income support policy uses income-testing heavily, such a conclusion might significantly change the allocation of public transfers.

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APPENDIX

Table A1. Sample characteristics of Household Budget Survey 2010

	Data set size	
	Sample frequency	Population frequency
No. of households	37 412	13 332 320
No. of persons	107 967	37 726 497

	Household size			
	Sample frequency	Sample percentage	Population frequency	Population percentage
1	6 700	17.91	3 307 035	24.80
2	11 087	29.63	3 097 050	23.23
3	7 838	20.95	2 653 892	19.91
4	6 737	18.01	2 405 045	18.04
5	3 003	8.03	1 085 993	8.15
6+	2 047	5.47	788 003	5.91

Source: Own calculations on HBS 2010.

Table A2a. One-person households (%)

OECD approach deciles	Subjective approach deciles										
	1	2	3	4	5	6	7	8	9	10	Total
1	**100**	0	0	0	0	0	0	0	0	0	10.67
2	70.17	**29.72**	0.1	0	0	0	0	0	0	0	12.44
3	15.4	73.71	**10.89**	0	0	0	0	0	0	0	12.84
4	6.22	38.56	50.81	**4.28**	0.12	0	0	0	0	0	11.99
5	0.87	20.57	44.03	31.84	**2.58**	0.12	0	0	0	0	10.83
6	0	7.34	22.53	44.11	24.62	**1.4**	0	0	0	0	9.35
7	0	1.55	12.44	29.61	36.99	17.03	**2.39**	0	0	0	8.24
8	0	0	2.93	16.64	25.54	30.97	22.22	**1.51**	0.18	0	7.06
9	0	0	0	1.8	12.74	23.98	30.08	25.58	**5.82**	0	7.96
10	0	0	0	0	0	1.65	10.14	21.11	31.63	**35.47**	8.61
Total	22.22	20.82	15.61	11.84	8.46	5.79	5.04	3.96	3.2	3.06	3 250 550

Source: Own calculations on HBS 2010.

Table A2b. Parents with three children (%)

OECD approach deciles	Subjective approach deciles 1	2	3	4	5	6	7	8	9	10	Total
1	**45.39**	44.56	7.83	2.23	0	0	0	0	0	0	20.72
2	0	**11.56**	57.12	26.21	5.1	0	0	0	0	0	14.84
3	0	0	**8.73**	38.78	39.66	11.42	1.41	0	0	0	13.66
4	0	0	0	**3.17**	40.32	45.4	9.26	1.86	0	0	10.89
5	0	0	0	2.39	**6.85**	36.89	42.99	10.87	0	0	9.71
6	0	0	0	0	8.17	**9.69**	29.81	46.53	5.81	0	8.42
7	0	0	0	0	0	1.65	**23.71**	48.74	24.75	1.14	6.45
8	0	0	0	0	0	0	6.07	**30.27**	52.25	11.4	7.45
9	0	0	0	0	0	0	0	2.55	**32.67**	64.78	4.49
10	0	0	0	0	0	0	0	0	6.86	**93.14**	3.37
Total	9.41	10.95	11.29	10.23	11.92	11.01	9.86	10.69	7.68	6.97	429 133

Source: Own calculations on HBS 2010.

Table A2c. Other households with a child (%)

OECD approach deciles	Subjective approach deciles 1	2	3	4	5	6	7	8	9	10	Total
1	**35.56**	30.84	22.66	8.28	2.14	0.52	0	0	0	0	14.01
2	1	**8.72**	22.53	34.2	22.56	8.74	2.05	0.2	0	0	13.90
3	0	2.74	**7.52**	21.09	33.67	22.68	10.34	1.8	0.17	0	12.05
4	0	0.15	2.36	**9.8**	17.18	31.88	24.22	12.49	1.92	0	11.32
5	0	0	0.19	5.08	**7.9**	20.83	33.7	25.52	6.29	0.49	11.32
6	0	0	0	0.6	3.08	**10.31**	20.05	40.65	24.24	1.06	10.12
7	0	0	0	0.16	1.43	4.45	**12.93**	24.52	46.89	9.61	9.49
8	0	0	0	0	0	0.9	3.32	**12.34**	49.35	34.09	7.84
9	0	0	0	0	0	0	0.51	3.24	**24.1**	72.15	6.41
10	0	0	0	0	0	0	0	0	1.96	**98.04**	3.53
Total	5.12	5.88	7.5	10.22	10.78	11.52	11.64	12.16	13.34	11.84	1 855 766

Source: Own calculations on HBS 2010.